



**U.S. Army Corps
of Engineers
St. Paul District**

Phase II Report

MPCA Phase II Investigation Work Plan

CONTAMINATED MATERIALS & GROUNDWATER INVESTIGATION WORK PLAN

**Chaska Flood Control Project
Stages 3 and 4
Chaska, Minnesota**

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TABLE OF CONTENTS

Description	Page
<u>Introduction</u>	1
<u>Background Information</u>	2
<u>Scope of Work</u>	3
General	3
Task 1 - Work Plan and Health/Safety Plan	3
Task 2 - Field Investigation Work	3
<u>Contaminated Materials</u>	3
Hand Auger Borings	3
Soil Borings	5
<u>Groundwater</u>	5
Task 3 - Phase II Investigation Report	6
<u>Methodology</u>	6
Soil Borings	6
Hand Auger Borings	7
Soil Classification	7
Soil Sampling and Chemical Analysis	7
Decontamination	7
Soil Headspace Analysis	7
Chain of Custody	8

APPENDICES

List of Appendices

Appendix A - Figures

Appendix B - Sample Specifications

List of Figures

Figure 1 - Location Map

Figure 2 - General Plan - Stage 4

Figure 3 - Typical Sampling Locations

Figure 4 - Typical Sampling Locations

Figure 5 - Typical Sampling Locations

Phase II Contaminated Materials and Groundwater Investigation
(Environmental Site Assessment)
Work Plan

Chaska Flood Control Project
Stages 3 and 4
Chaska, MN

Introduction

This Phase II Investigation Work Plan discusses the field work and laboratory testing required to determine the extent of contaminated materials to be encountered during the construction of Stage 4 of the Chaska Flood Control Project. This work plan was developed in response to indications of potentially contaminated soils and groundwater (petroleum products, petroleum product and solvent odors, and dump/debris fill) encountered in several geotechnical soil borings advanced for geotechnical design purposes along the proposed levee and channel alignments. These borings were advanced for physical property testing rather than for contaminant analysis since contaminated materials and/or groundwater were not anticipated on these stages of the flood control project. In addition, potential contamination sources were identified during a Phase I Environmental Site Assessment for these stages of the flood control project.

According to the Minnesota Pollution Control Agency (MPCA) document "Update on Property Transfer Cleanup Assistance", a Phase II Investigation Work Plan is required to determine if the potential sources of contamination identified during the Phase I Investigation are actually causing a release or threatened release of hazardous substances to the soil and groundwater at the project site. It is expected that the Phase I Investigation Report and the Phase II Investigation Work Plan be submitted for review and approval before the voluntary party proceeds with the Phase II field work.

The objectives of the Phase II Investigation Work Plan are:

- a. to describe how the potential sources identified in the Phase I Investigation will be investigated to determine whether there has been a release of hazardous substances and to determine the magnitude, sources, and receptors of any releases or threatened releases.
- b. to provide the MPCA staff an opportunity to comment on the planned work in order to reduce the possibility that additional investigative work which may include mobilizing into the field for a second time will be suggested by the MPCA staff.
- c. to help establish a minimum level of inquiry to be conducted during the Phase II Investigation.

The Phase I Investigation determined that a Phase II Investigation is not required for Stage 3 of the Chaska Flood Control Project. This work plan will address only the field work and laboratory testing required for Stage 4.

It is proposed that a combination of soil borings and hand auger borings be used, within the project construction limits and adjacent to the sources of potential contaminant release, to obtain soil samples. The soil samples should be analyzed for contaminants and the results evaluated to assess the extent of contamination. It is anticipated that the Geoprobe unit will be used to ascertain whether groundwater contamination exists and the extent of the contaminant plume. If the results of the Geoprobe work indicate excessive levels of groundwater contamination, a series of groundwater monitoring wells may need to be installed to further define the contaminants and their anticipated movements. Evaluation of groundwater quality is vital since Stage 4 of the Chaska Flood Control Project requires significant dewatering.

Background Information

Stage 4 of the Chaska Flood Control Project consists of 2,800 feet of new levee on the south and east side of Courthouse Lake and raising 4,200 feet of existing levee on the south side of the City of Chaska. Stage 4 also includes an elaborate system of relief wells and interceptor pipes on the landward side of the levee, as well as the use of wick drains and a staged construction of the levee to consolidate and strengthen the foundation soils under the new levee prism and under the fill sections required to raise the levee to its required top elevation. Further discussion on these features is included in the Phase I Investigation Report. A Location Map is included as Figure 1. A General Plan for Stage 4 is included as Figure 2.

Eight soil borings advanced by the Corps of Engineers (soil borings 73-2M, 82-51M, 89-111M, 89-126M, 80-25M, 89-110M, 89-106M, and 79-12M) and 12 soil borings advanced by others (soil borings ST-1, ST-2, ST-6, ST-8, ST-10, and ST-11 at the wastewater treatment plant and soil borings B-12, B-13, B-15, B-17, B-27, and B-30 at the proposed Carver County Courthouse expansion) identified potential sources of contaminated materials and/or groundwater, dump/debris fill materials, and methane gas within or immediately adjacent to the project limits required for construction. The locations of these soil borings in relation to the project limits are shown in the Phase I Investigation Report. A thorough discussion of these soil borings is found in the Phase I Investigation Report.

The sources of the contamination appear to be the burn/dump site east of the wastewater treatment plant (Station 21+00 to Station 28+00) and an abandoned dump site west of the abandoned railroad line (Station 34+00 to Station 37+00).

Scope of Work

General

To assess the extent and magnitude of the contaminated materials and groundwater, the following tasks will need to be completed.

Task 1 - Develop a work plan and a site health/safety plan.

Task 2 - Perform field investigations.

Task 3 - Submit a Phase II Investigation Report.

Task 1 - Work Plan and Health/Safety Plan

The Corps of Engineers will be contracting the Phase II Investigation work to an A-E Contractor. This Contractor will develop the field work methodologies, laboratory testing methodologies, quality assurance project plan, and the site health and safety plan for the work. This Contractor has worked on two previous Phase II Investigations for the Corps of Engineers and they are familiar with the basic requirements of a Phase II Investigation.

Task 2 - Field Investigation Work

Contaminated Materials

A definite contaminated materials area exists at the dump site from Station 21+00 to Station 28+00 and from Station 30+00 to Station 37+00. The raising of the levee in these areas will require the placement of new impervious fill against the exposed dump materials. Excavation and other work related to the construction of the flood control project in these areas, such as stripping, clearing and grubbing, construction of relief wells and storm sewer system pipes and manholes, removal of an existing forcemain, installation of a wick drain system, and for a required inspection/cutoff trench will most likely encounter contaminated materials.

The field work to be completed for the Phase II Investigation to identify contaminated materials and to determine the extent and magnitude of the contaminated materials will consist of shallow hand auger borings and shallow to deep soil borings requiring a drill rig. Samples will be collected and sent to an analytical laboratory to determine the nature of the materials. Test pits were considered instead of borings in some areas, but will not be used to minimize the amount of material to dispose of.

Hand Auger Borings

Hand auger borings will be used in areas which require a determination of the nature of the materials to a depth of 1 to 3 feet. The logical place to use hand auger borings is from Station 21+00 to Station 28+00 where the new levee

will be placed immediately adjacent to the burn/dump site. The ground surface in this area is currently scattered with debris of miscellaneous nature. The construction work in this area requiring excavation is stripping, clearing and grubbing, and possibly scarifying of the material encountered upon completion of the stripping operations.

Stripping is required to assure a good bond between the existing fill material and the new impervious levee fill. The depth of stripping in this area is being kept at a minimum to minimize the amount of material which will need to be disposed of, most likely at an approved solid waste landfill. At the present time, the Contractor will be required to remove and dispose of all obvious debris materials. The stripping operations will commence upon removal of all debris materials. A copy of a typical stripping specification is included in Appendix B.

Clearing and grubbing is required for removal of all trees on any areas where fill is to be placed. Grubbing specifications require grubbing of all roots larger than 1-1/2 inches in diameter to a depth of 3 feet. The requirements for the grubbing operations may be reduced to minimize the volume of grubbing materials. A copy of a typical clearing and grubbing specification section is included in Appendix B.

Scarifying of the ground surface is required when the existing fill upon which the new levee fill is to be placed does not meet minimum density requirements. Should scarifying be required, the material is disturbed to a depth of 12 inches. The material is then compacted in place. This operation does not require removal of material, but does disturb the insitu soils. Due to the nature of the soil materials in this area, the scarifying requirements may be reduced for this project.

Two hand auger borings three feet deep will be advanced every 200 feet at Stations 22+00, 24+00, 26+00, 32+00, and 34+00. The hand auger borings will be advanced such that the entire extent of potential stripping and clearing and grubbing operations which may encounter contaminated materials will be covered. The hand auger borings will be advanced perpendicular to the slope. Samples will be field screened using the Jar Headspace Procedure. A composite sample will be collected from the two hand auger borings for each Station and submitted for laboratory analysis. This will result in 10 hand auger borings and 5 lab samples, outside of the sampling and testing required for QA/QC purposes. Typical locations of hand auger borings are shown in Figures 3 through 5.

Samples will be analyzed for the following parameters for unknown hydrocarbon contamination:

- a. Benzene, Toluene, Ethylene, and Xylene (BTEX)
- b. Polynuclear Aromatic Hydrocarbons (PAHs)
- c. Toxicity Characteristics Leaching Procedure (TCLP)
- d. PCBs

The Toxicity Characteristics Leaching Procedure (TCLP) methodologies test for the concentrations of the 8 RCRA metals including arsenic (As), barium (Ba),

cadmium (Cd), chromium (Cr), lead (Pb), mercury (Hg), selenium (Se), and silver (Ag). Samples with metals concentrations exceeding MPCA regulatory levels would be classified as hazardous waste.

Soil Borings

The practical extent of a hand auger boring is approximately three feet. Some of the construction will require deeper excavations. Soil borings advanced by mechanical means will be used to verify the nature of the materials in these areas.

Soil borings will be advanced at the proposed location of relief wells RW-34, RW-35 and RW-36 to approximately Elevation 695. Soil borings will also be advanced at the proposed locations of MH 13, MH 14, and every 100 feet along the proposed east interceptor pipe between MH 23 and MH 14. These soil borings shall be advanced to a depth of 20 feet. Soil borings will also be advanced every 100 feet along the proposed inspection/cutoff trench from Station 35+00 to 37+00, inclusive. These borings shall be advanced to a depth of 15 feet. The locations of the soil borings are shown in Figures 3 through 5.

Groundwater

Groundwater contamination is suspected from approximately Station 23 to approximately Station 30.

A wick drain system is being used in conjunction with a staged construction of the levee to strengthen the soils underlying the new portions of the levee due to the levee raise. The wick drains are used to promote rapid drainage of the foundation soils to accelerate the consolidation of the soft soils. The accelerated consolidation of the foundation will allow the entire levee to be constructed in a two year timeframe.

The wick drains are long pieces of a geosynthetic drainage medium which are driven into the ground on a given grid spacing. The material acts as a wick, draining the groundwater from the soil pores. The wicks drain vertically up into a sand layer containing horizontal strip drains, which is designed to drain to a specific location, in this case the river side of the levee. Since evidence of petroleum products and solvents has been found in areas where the wick drains are to be used, the wick drain system may be required to drain to a location which allow for testing of the water prior to discharge.

The Geoprobe unit owned by Terracon will be used to determine if the groundwater is contaminated within and adjacent to the project limits. The Geoprobe unit consists of a hydraulically advanced sampling rig and an onboard GC-MS unit. The operator advances the sampling rig to the specified depth, obtains a sample of the groundwater, retrieves the sample, and obtains test results almost immediately. The results of the Geoprobe testing can be used to readily define the limits of groundwater contamination in a given area.

The initial Geoprobe pattern will consist of sampling every 250 feet starting at Station 20+00 through Station 38+00. Since the burn/dump area contains materials which would prohibit advancing the sampling probe, the Geoprobe work will be completed riverward of the toe of the levee, in the area where the wick drains will be used. Sampling downstation of Station 20+00 and upstation of Station 38 will be required only if field results indicate contamination at Station 20 and/or at Station 38. Typical Geoprobe sampling locations are shown in Figures 3 through 5.

Samples will be tested for BTEX, PCBs, and the constituents listed in MPCA Method 465D.

If the results of the Geoprobe work indicate excessive levels of contamination or do not clearly define the groundwater problem, the Phase II Investigation Field Work will be expanded to include a series of groundwater monitoring wells. If the soils prove to contain an excessive amount of fine grained particles which would prohibit collecting water samples in a timely manner, water samples will be collected using a well point inserted into an auger hole backfilled with clean sand. The well point would be developed per standard well sampling protocol prior to obtaining a water sample.

Task 3 - Submit Phase II Investigation Report

The Phase II Investigation Report will be prepared by the A-E Contractor performing the Phase II Investigation field work. The draft report should be completed approximately one month following completion of the field work.

Methodology

Soil Borings

The Contractor will advance the required soil borings utilizing the Field Work Methodologies to be developed by the Contractor. Sampling shall be continuous split spoon sampling. No augering ahead will be allowed. Augering will be allowed only for cleaning out the hole to the next Standard Penetration Test (SPT) level upon completion of a SPT. Jar samples shall be collected at minimum 5.0' intervals, at changes in soil stratum, or if a soil sample has been determined to be contaminated. Water levels shall be determined in the boring after proper stabilization of the water level in the hole. Soils shall be classified in the field using the Unified Soil Classification System (UCS).

The geologist shall use visual and olfactory preliminary screening while sampling. If contaminated soils are suspected to exist, the more formal headspace screening to be discussed below shall commence. A soil sample shall be considered to be contaminated if the contaminant level in the sample is 1 ppm over background levels. The sampling interval shall be decreased to every 2.5 feet until evidence of contamination no longer exists. The soils monitoring shall be noted on the field logs. Sampling methods, decontamination procedures, and headspace analysis procedures shall follow the Field Work Methodologies submitted by the Contractor. Chain of custody

procedures shall be initiated upon collection of a soil sample collected for laboratory chemical analysis. All contaminated soil cuttings must be containerized on the site. Soil cuttings will become the property of the Corps of Engineers. One composite sample shall be collected from the soil cuttings and tested for the MPCA Unknowns parameters to determine the ultimate disposal method for the cuttings.

Hand Auger Borings

The hand auger borings will be advanced with a standard hand auger. Soil samples will be collected as quickly as possible after auger retrieval to minimize volatilization of any volatile compounds. The hand auger borings will be backfilled with auger cuttings and adjacent native soils.

Soil Classification

As the soil samples are obtained in the field, they will be visually and manual inspected by the field geologist. The samples will be screened for total organic vapors using an hNu photoionization detector (or equivalent) and for hydrocarbon contamination using visual and olfactory evidence as criteria. If evidence of hydrocarbon contamination exists, samples may be collected for chemical analysis. Logs of the borings indicating the depth and identification of the various strata and other pertinent information will be prepared.

Soil Sampling and Chemical Analysis

Soil samples collected for chemical analysis will be placed in laboratory cleaned glass jars for delivery directly to the laboratory for chemical analysis. Samples will be transported to the laboratory, in ice-filled coolers, within 24 hours of sampling. The holding time for the VOC analyses is 14 days, so the laboratory must analyze the samples within this 2-week period.

Decontamination

To minimize cross-contamination, the hand auger and split spoon sampling tools will be cleaned and rinsed between samples. The cleaning procedure will consist of a soap and water wash using a brush and tap water rinse. The soap and water will be changed regularly during the sampling. All drill rig and hand auger equipment and associated tools will be steam cleaned and rinsed before the initiation of the project and will be cleaned and rinsed between borings if contamination is detected. Fluids used in cleaning the hand auger and drill rig equipment will be allowed to evaporate on site.

Soil Headspace Analysis

Soil samples will be screened using a Flame Ionization Detector or an hNu Model 101 Photoionization Detector equipped with a 10.2 or 11.7 eV lamp and calibrated for reading in parts per million volume/volume of benzene. An eight ounce glass jar will be half filled with soil and immediately covered with two layers of aluminum foil (shiny side up) after which the lid is

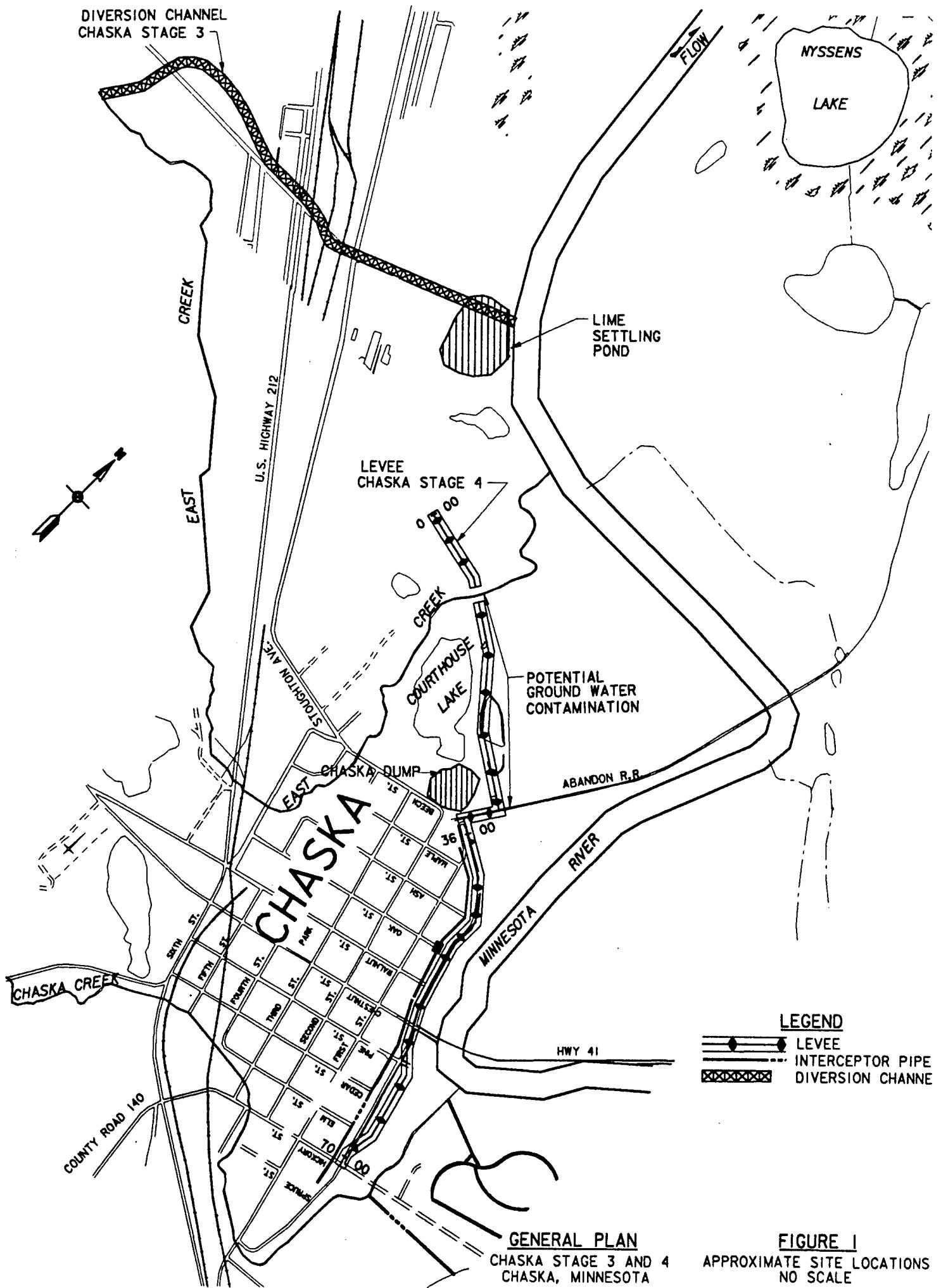
applied tightly to the jar. The jar will be shaken for 15 seconds, then the samples will be stored for 10 minutes in an atmosphere of at least 32 degrees Fahrenheit. After headspace development (a minimum of 10 minutes) the jar will be shaken for another 15 seconds. Next, the lid will be removed and the foil seal punctured with the sample probe. The highest meter response in a time period of two to five seconds after insertion will be recorded for each sample.

Chain of Custody

Upon collection of a sample, a chain of custody log will be initiated. The chain of custody record includes the following information: project, work order number, shipped by, shipped to, sampling point, location, field ID number, date and time taken, sample type, number of containers, analysis required, sampler(s) signature(s), and other pertinent information. As few people as possible will handle the sample containers.

The chain of custody records will be carried with the samples to the laboratory. Upon arrival at the laboratory, the samples will be checked in and signed over to the appropriate laboratory personnel. A copy of the chain of custody will be turned over to the laboratory project manager. Upon completion of the laboratory analysis, the completed chain of custody record will be returned to the project manager.

APPENDIX A



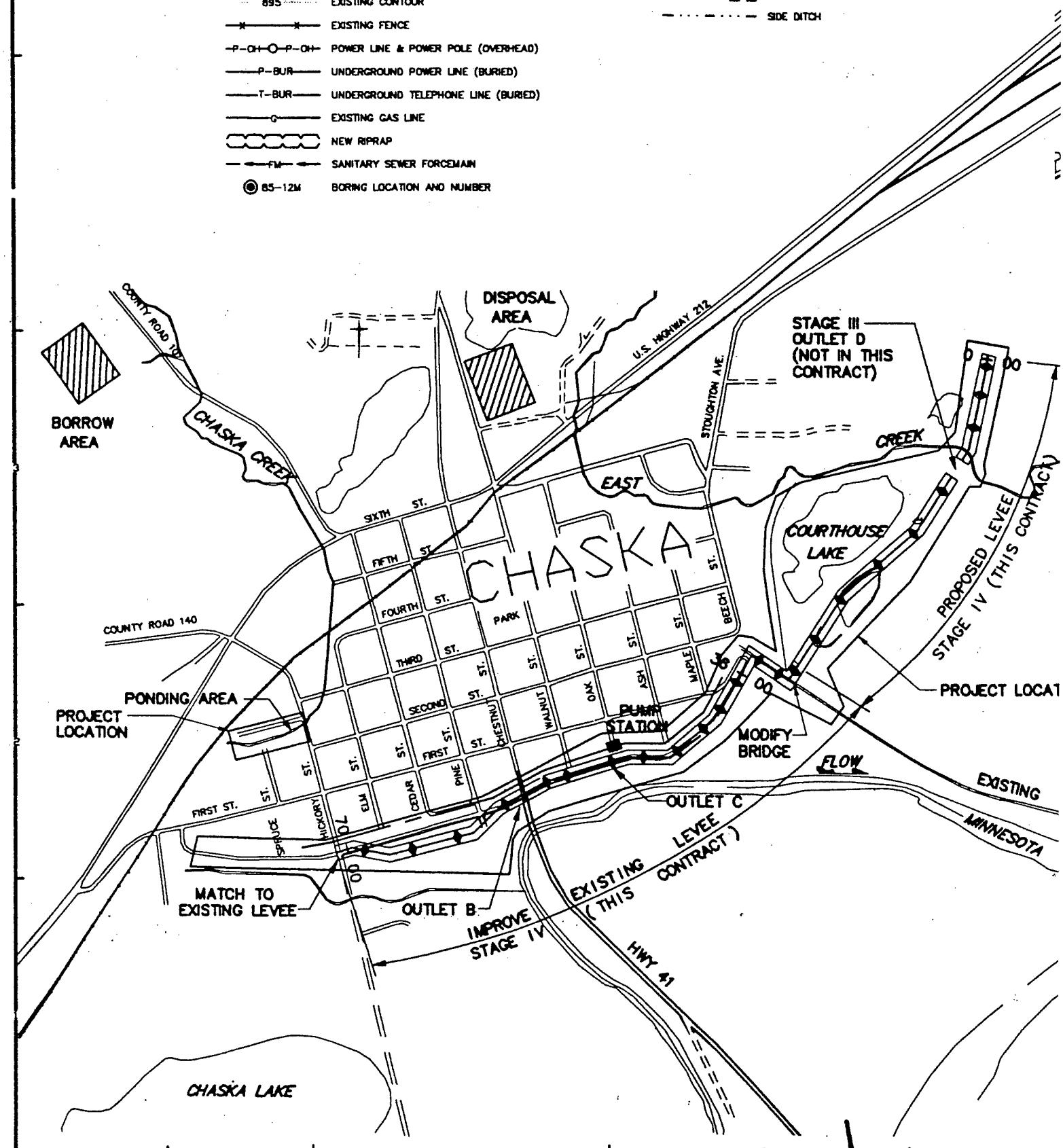
GENERAL PLAN
CHASKA STAGE 3 AND 4
CHASKA, MINNESOTA

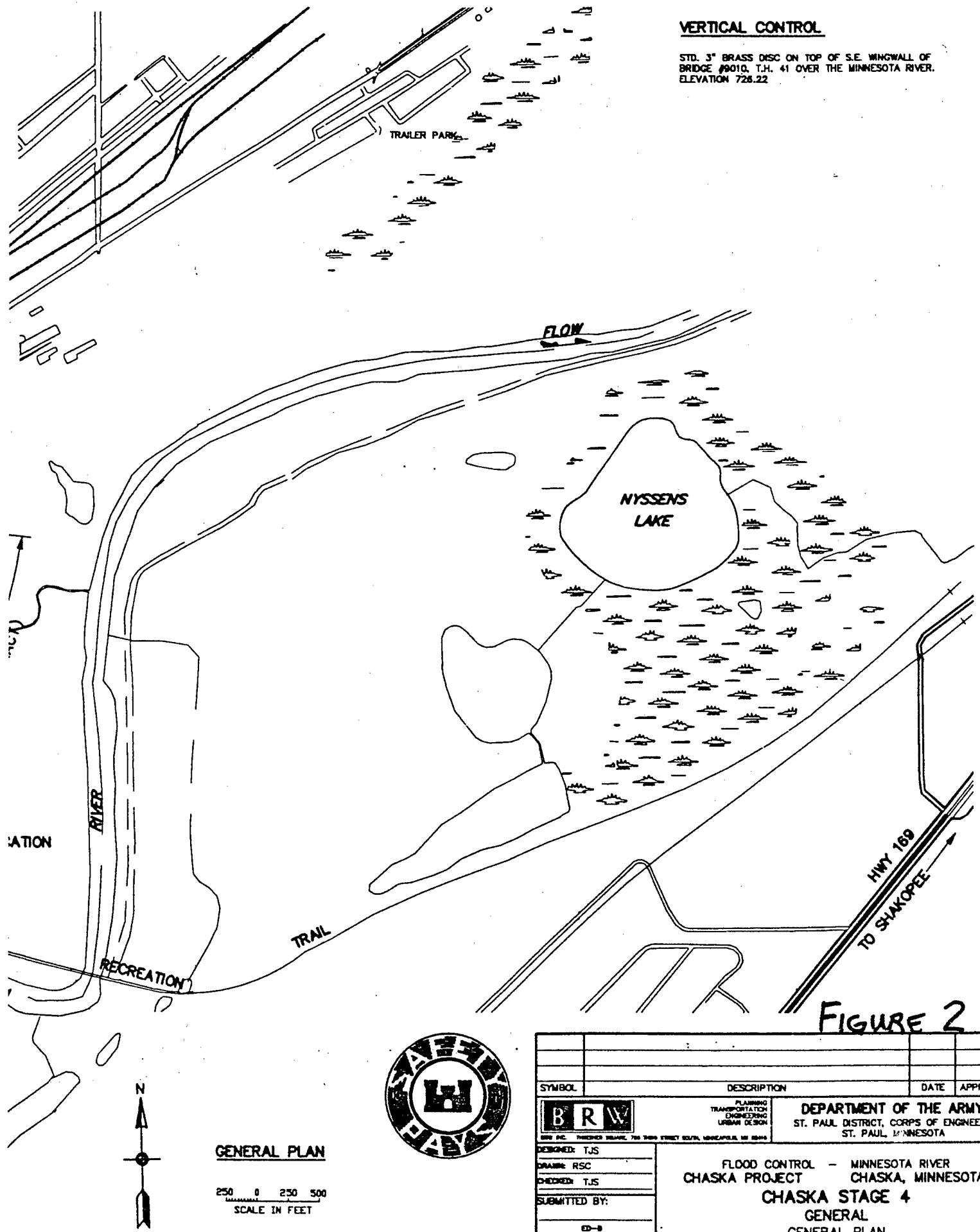
FIGURE I
APPROXIMATE SITE LOCATIONS
NO SCALE

LEGEND

- ♦— LEVEE
- ~~~~~ EXISTING LEVEE
- INTERCEPTOR PIPE
- P.P.— UNDERGROUND PETROLEUM PRODUCTS LINE
- S→ UNDERGROUND STORM SEWER PIPE
- ♦— VALVE
- 895 EXISTING CONTOUR
- *-* EXISTING FENCE
- P-OH-O-P-OH POWER LINE & POWER POLE (OVERHEAD)
- P-BUR— UNDERGROUND POWER LINE (BURIED)
- T-BUR— UNDERGROUND TELEPHONE LINE (BURIED)
- G— EXISTING GAS LINE
- NEW RIPRAP
- FM— SANITARY SEWER FORCEMAIN
- (●) BS-12M BORING LOCATION AND NUMBER

- DENOTES CUT
- DENOTES FILL
- LIMITS OF WORK (TYP.)
- TYPICAL SECTION X SECTION NUMBER
X/X— DWG. NO. WHERE SECTION IS LOCATED
- SIDE DITCH INLET
- EXISTING CULVERT
- SIDE DITCH

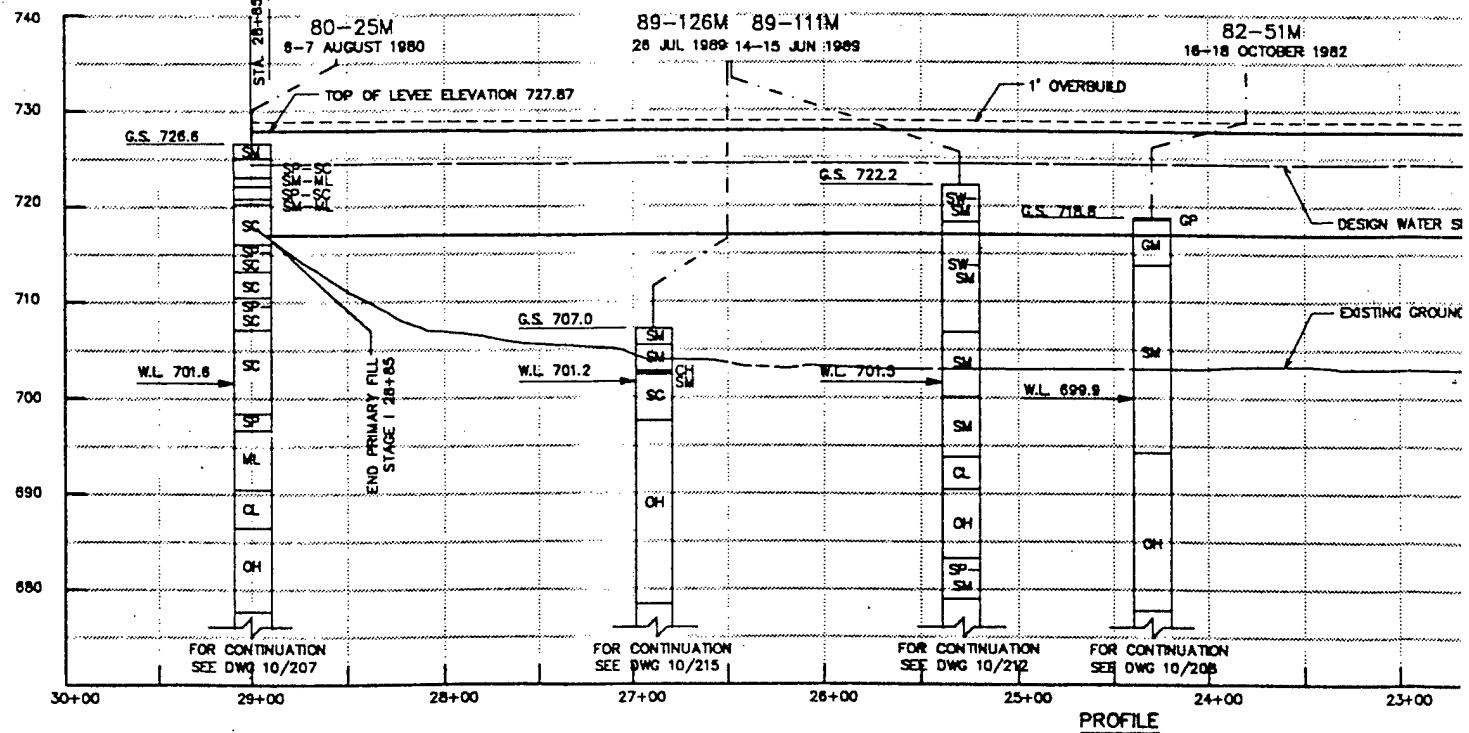
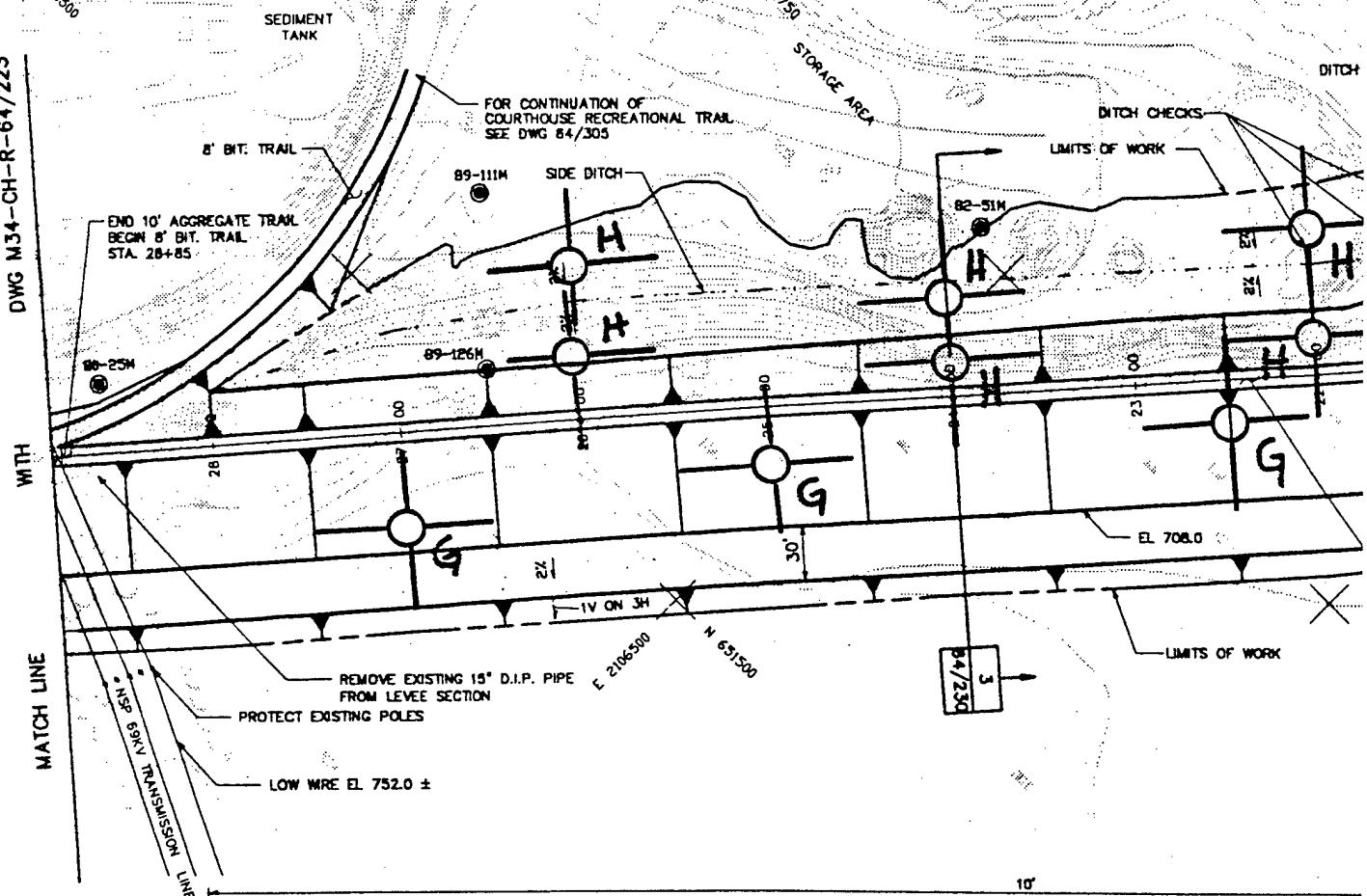


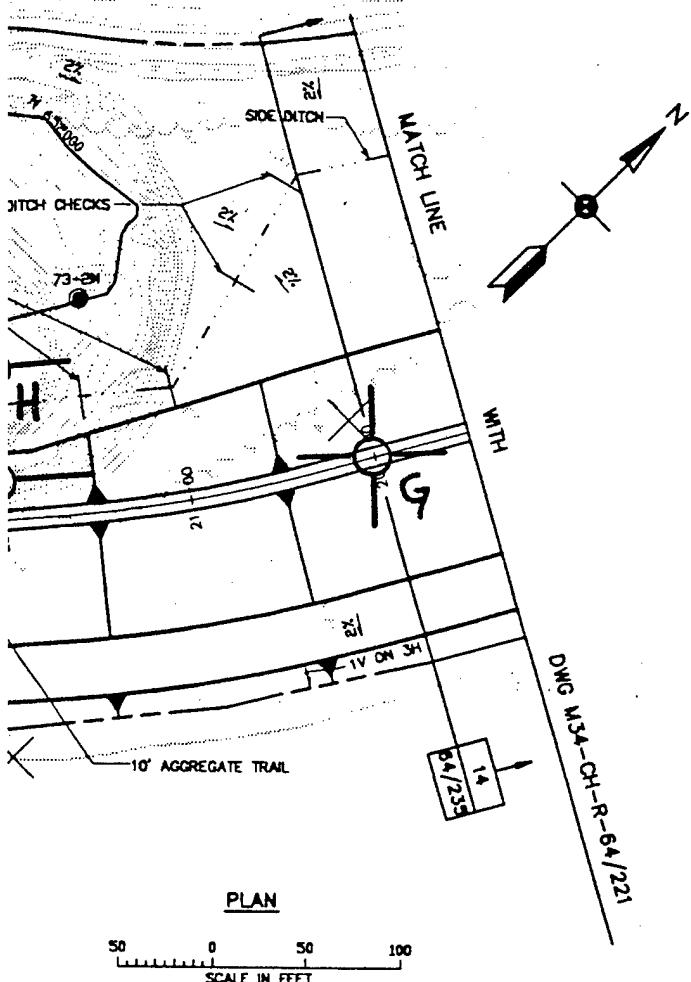


SYMBOL	DESCRIPTION	DATE	APPROVAL
B R W	PLANNING TRANSITION ENGINEERING URBAN DESIGN	DEPARTMENT OF THE ARMY ST. PAUL DISTRICT, CORPS OF ENGINEERS ST. PAUL, MINNESOTA	
DESIGNED: TJS	FLOOD CONTROL - MINNESOTA RIVER		
DRAINED: RSC	CHASKA PROJECT CHASKA, MINNESOTA		
CHESTERED: TJS	CHASKA STAGE 4		
SUBMITTED BY:	GENERAL GENERAL PLAN		
ED-B			
ED-SH	CAD FILE NAME: GEN-PLAN.DWG	DRAWING NUMBER:	SHR 2
DATE: 07-29-92	SPEC NO:	M34-CH-R-10/201 OF 119	

E 2106000
N 651500

DWG M34-CH-R-64/223





VERTICAL CONTROL POINT

BM-#3 - EL. 714.18 TOP OF I.P.
R/W MON. T-217

NOTES:

- ELEVATIONS REFER TO M.S.L. (1929 ADJ.)
- COORDINATES AND GRID FOR PROJECT ARE LAMBERT GRID, MINNESOTA SOUTH ZONE.
- EXISTING TOPOGRAPHIC GROUND LINES MAY VARY FROM THOSE SHOWN ON PLANS.
- SIDE DITCH SLOPES VARY TO 6% MAX
- PLACE 5" CLS AGGREGATE MATERIAL ON TOP OF LEVEE AFTER TRUCKS ARE DONE HAULING.
- PLACE SILT FENCE ALONG RIVERWARD SIDE OF LEVEE.

REFERENCES:

DWG NO.
1. GENERAL PLAN — — — — —
2. LEVEE ALIGNMENT — — — — —
3. AGGREGATE TRAIL TYPICAL — — — — —
4. BITUMINOUS TRAIL TYPICAL — — — — —
5. TEMPORARY EROSION CONTROL DETAILS — — — — —
6. COURTHOUSE LAKE RECREATIONAL TRAIL — — — — —

LEVEE TOP WIDTH
LEVEE LANDWARD SLOPE
LEVEE RIVERWARD SLOPE
LEVEE BERM

740

730

720

710

700

690

680

670

660

650

640

630

620

610

600

590

580

570

560

550

540

530

520

510

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170

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3100

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3250

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7150

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7300

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7600

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7800

7850

7900

7950

8000

8050

8100

8150

8200

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8800

8850

8900

8950

9000

9050

9100

9150

9200

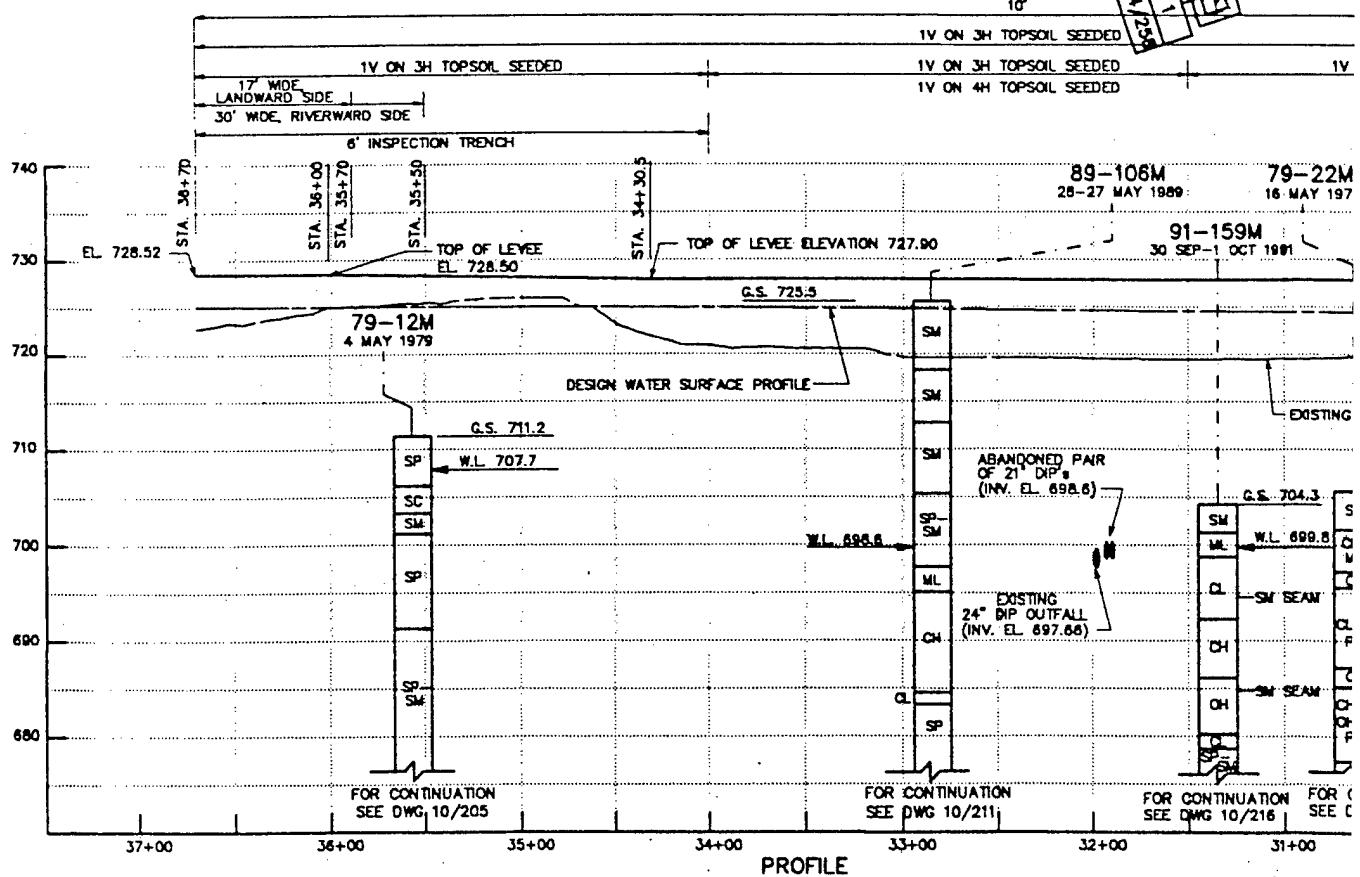
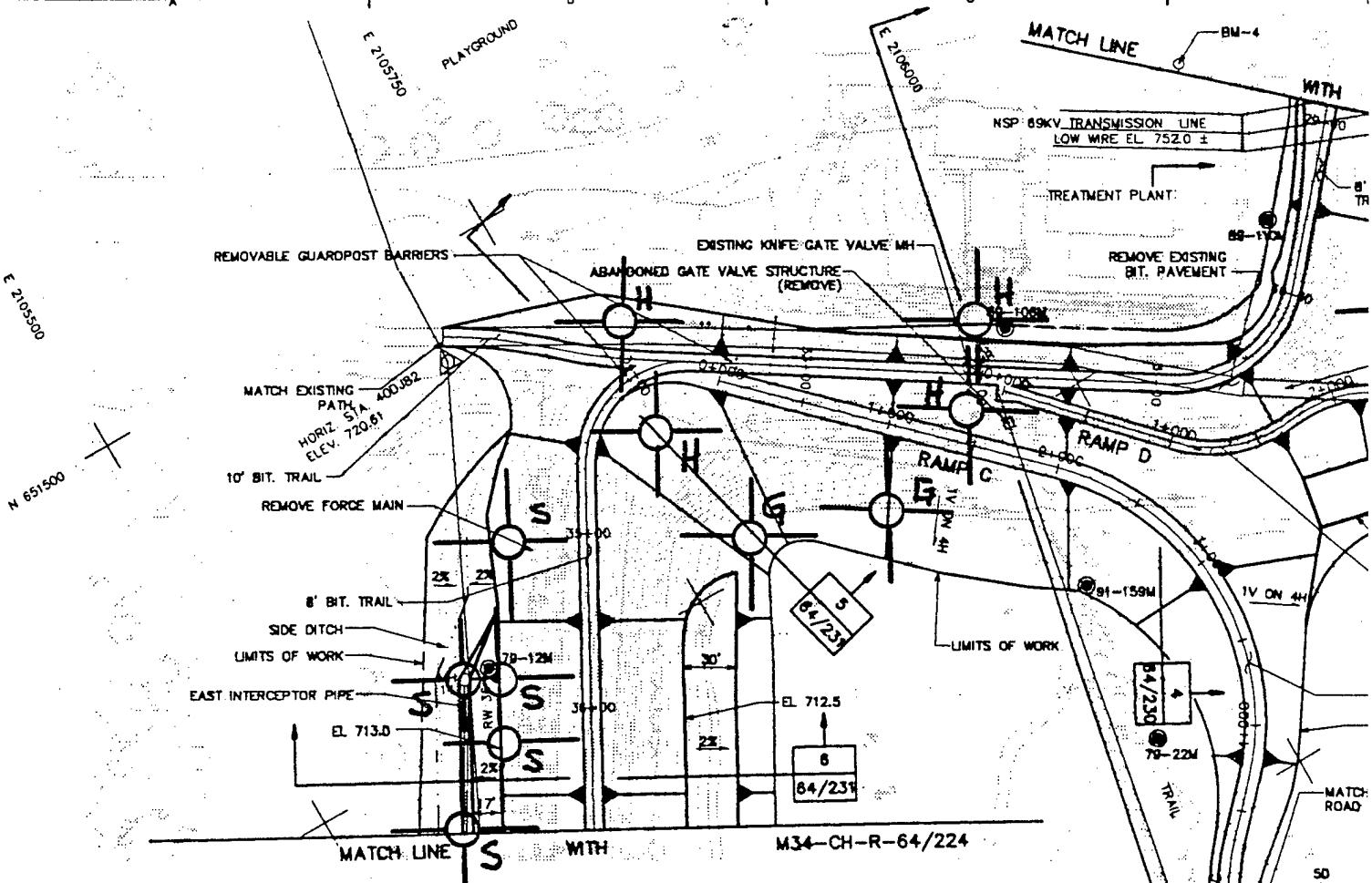
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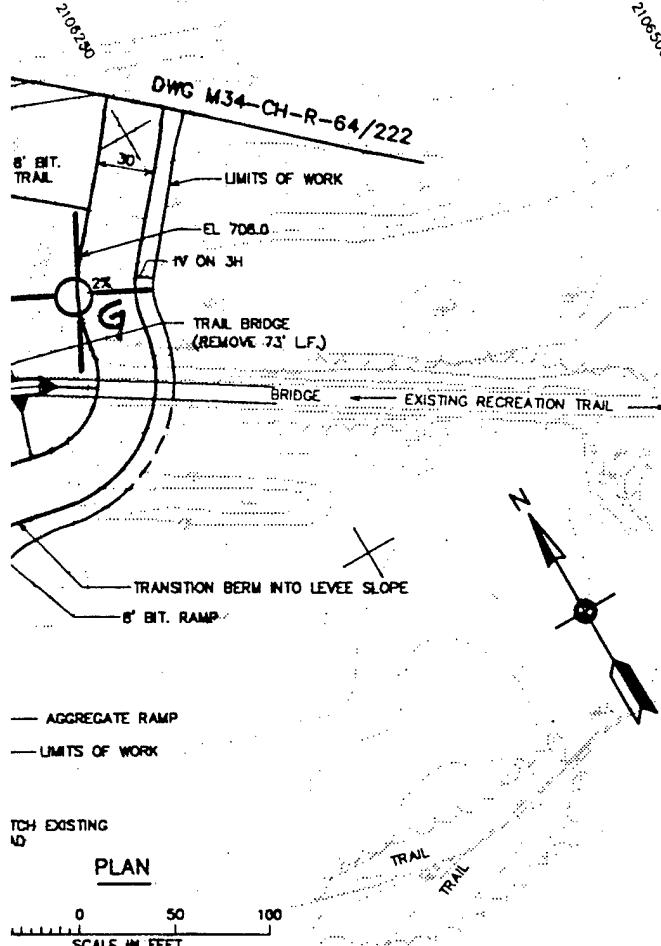
9300

9350

9400

9450





VERTICAL CONTROL POINT

BM-#4 - EL 725.86 TOP NUT OF HYDRANT
NE CORNER SEWAGE TREATMENT PLANT

HORIZONTAL CONTROL POINT

STA. 40082
X=2,105,693.203
Y=651,441.892

NOTES:

1. ELEVATIONS REFER TO M.S.L. (1929 ADJ.)
2. COORDINATES AND GRID FOR PROJECT ARE LAMBERT GRID, MINNESOTA SOUTH ZONE
3. EXISTING TOPOGRAPHIC GROUND LINES MAY VARY FROM THOSE SHOWN ON PLANS.
4. SIDE DITCH SLOPES VARY TO 8% MAX.
5. PLACE REMOVABLE GUARDPOST BARRIERS AT STA. 33+50 AND STA. 34+05.
6. CONSTRUCT SIDE DITCH ALONG LANDWARD OF LEVEE BERM TO DIRECT RUNOFF INTO INTERCEPTOR PIPE INLETS.
7. EXISTING DISTRIBUTION POWER LINES, POLES, AND GUY WIRES TO BE RELOCATED BY CITY FORCES.
8. ALL WATER MAIN, SANITARY SEWER AND FORCE MAINS BENEATH PROPOSED LEVEE SHALL BE REMOVED.
9. PLACE SILT FENCE ALONG NORTH SIDE OF LEVEE TO PREVENT MATERIAL FROM GOING INTO SEWER TREATMENT PLANT, STA. 34+00 TO STA. 29+00, AS DIRECTED BY THE ENGINEER IN THE FIELD.
10. RELOCATE ALL BENCHES AND SIGNS. REMOVE EXISTING TIMBER GATE AND POSTS.
11. PLACE SILT FENCE ALONG RIVERWARD SIDE OF LEVEE.

REFERENCES:



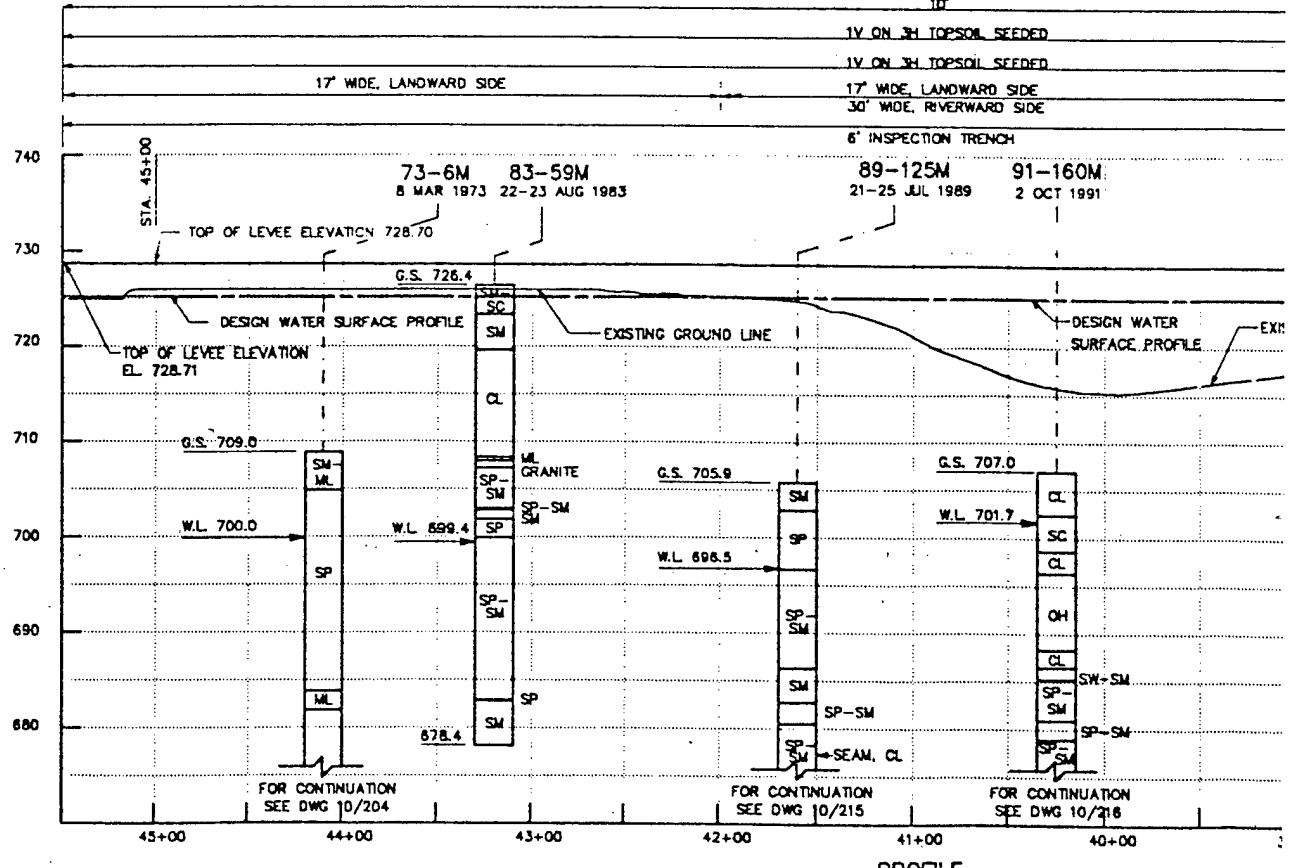
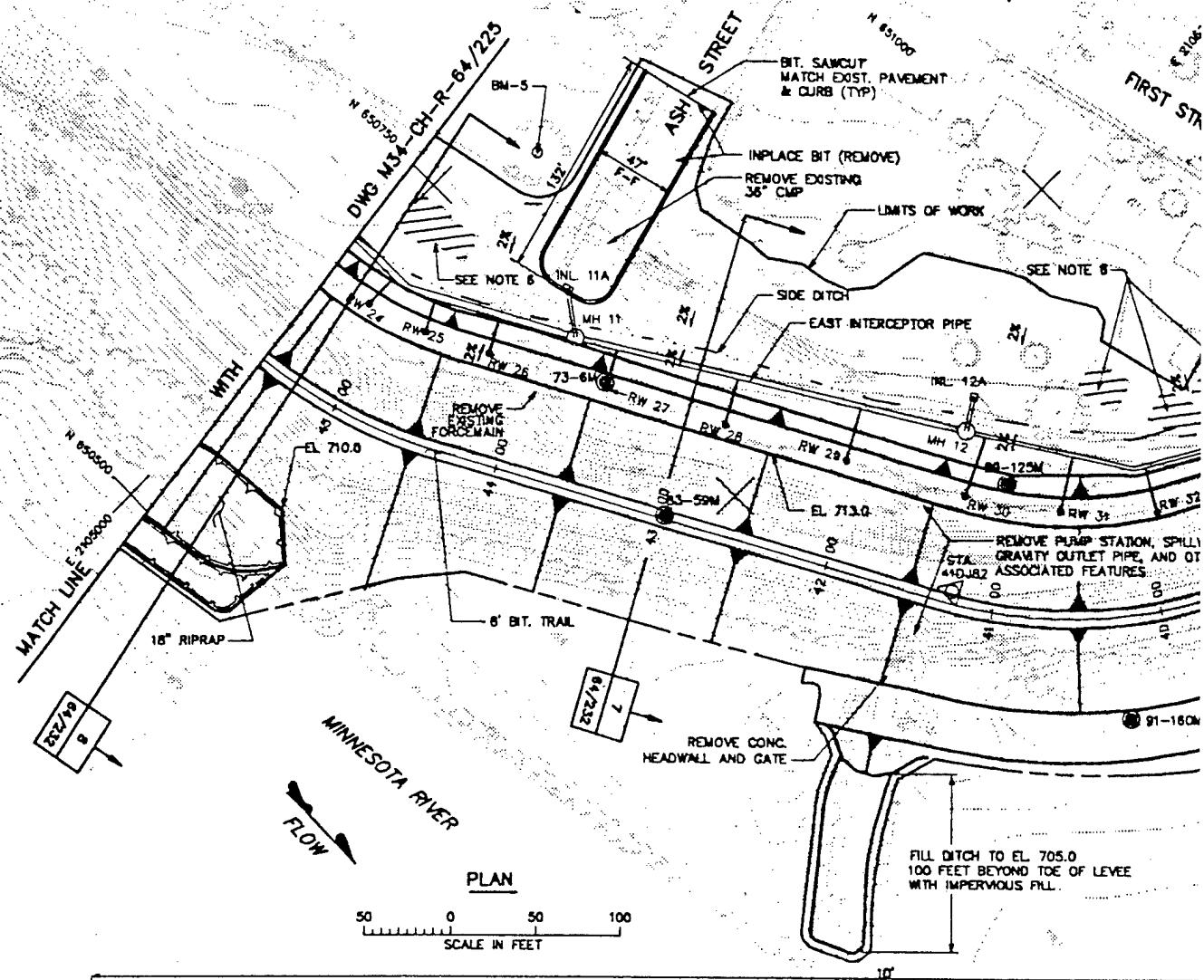
H HAND AUGERS

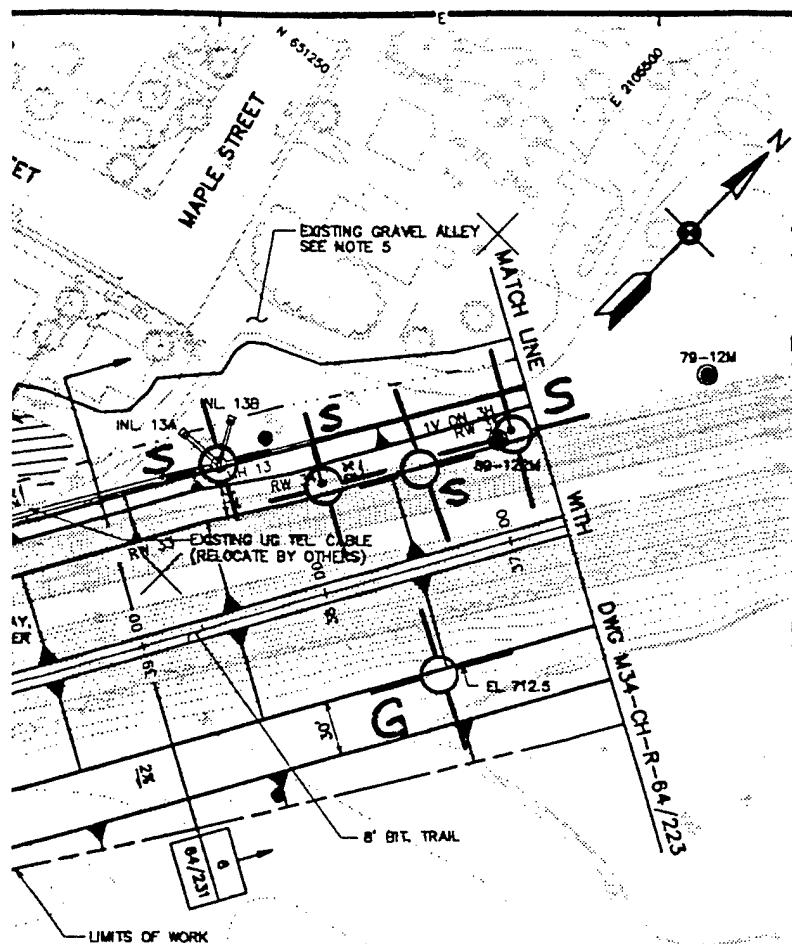
S SOIL BORINGS

G GEOPROBE

Figure 4

SYMBOL	DESCRIPTION	DATE	APPROVAL
B R W	PLANNING TRANSPORTATION ENGINEERING URBAN DESIGN	DEPARTMENT OF THE ARMY ST. PAUL DISTRICT, CORPS OF ENGINEERS ST. PAUL, MINNESOTA	
DESIGNED: TJS	FLOOD CONTROL - MINNESOTA RIVER		
DRAINED: RSC	CHASKA PROJECT CHASKA, MINNESOTA		
CHECKED: TJS	CHASKA STAGE 4		
SUBMITTED BY:	DRAINAGE & LEVEES		
ED-B.	PLAN & PROFILE		
ED-OH	STA. 28+90 TO STA. 38+70		
DATE: 07-29-92	CAD FILE NAME: MN1OP004.DWG	DRAWING NUMBER: MM34-CH-R-64/223	ISHT 24 OF 119
	SPEC NO:		





VERTICAL CONTROL POINT

BM-#5 - EL. 710.83 2 NAILS IN SO
FACE OF ASH SO END ASH ST.
± 36' SE OF SE CORNER OF GARAGE

HORIZONTAL CONTROL POINT

STA. 41DJ82
X=2,105.378,527
Y=650,800.401

NOTES:

1. ELEVATIONS REFER TO M.S.L. (1929 ADJ.)
2. COORDINATES AND GRID FOR PROJECT ARE LAMBERT GRID, MINNESOTA SOUTH ZONE
3. EXISTING TOPOGRAPHIC GROUND LINES MAY VARY FROM THOSE SHOWN ON PLANS.
4. SIDE DITCH SLOPES VARY TO 6% MAX.
5. REPLACE 10' GRAVEL ALLEY WHERE DISTURBED STA. 37+00.
6. BUILDINGS TO BE REMOVED BY OTHERS. CONTRACTOR SHALL REMOVE SLAB OR FOUNDATION AND BACKFILL WITH GRANULAR MATERIAL.
7. CONSTRUCT SIDE DITCH ALONG LANDWARD OF LEVEE BERM TO DIRECT RUNOFF INTO INTERCEPTOR PIPE INLETS.
8. EXISTING DISTRIBUTION POWER LINES, POLES, AND GUY WIRES TO BE RELOCATED BY CITY FORCES.
9. ALL WATER MAIN, SANITARY SEWER AND FORCE MAINS BEneath PROPOSED LEVEE SHALL BE REMOVED.
10. PLACE SILT FENCE ALONG RIVERWARD SIDE OF LEVEE.
11. PROPOSED CURB & GUTTER IN ASH TO HAVE OUTFALL GUTTER TO INLET 11A. FIELD VERIFY TOP OF CURB ELEVATIONS AND PROVIDE CURB CUTS TO ALLOW SIDE DITCH TO DRAIN INTO INLETS.

LEVEE TOP WIDTH

LEVEE LANDWARD SLOPE

LEVEE RIVERWARD SLOPE

LEVEE BERM

REACH

740

TOP OF LEVEE ELEVATION 728.52

730

TIN G GROUND LINE

G.S. 710.5

720

710

700

690

680

SM

SP

SP

SP

SW-SM

SP-SW

SP-SM

SP-SM

SP-SW

SP-SM

W.L. 697.1

FOR CONTINUATION
SEE DWG 10/214

9+00 38+00 37+00

REFERENCES:

1. GENERAL PLAN	10/201
2. LEVEE ALIGNMENT	64/218
3. EAST INTERCEPTOR PIPE	64/255
4. INLET SCHEDULE	64/252
5. RELIEF WELL	64/254
6. TEMPORARY EROSION CONTROL DETAILS	64/237



H Hand Auger

S Soil BORING

GEOPIROBE

Figure 3

SYMBOL	DESCRIPTION	DATE	APPROVAL
B R W B.R.W. INC., THREEHORN BUILDING, 700 THREE STREET SOUTH, MINNEAPOLIS, MN 55402	<p>PLANNING TRANSPORTATION ENGINEERING URBAN DESIGN</p> <p>DEPARTMENT OF THE ARMY ST. PAUL DISTRICT, CORPS OF ENGINEERS ST. PAUL, MINNESOTA</p>		
DESIGNED: TJS	FLOOD CONTROL - MINNESOTA RIVER		
DRAWN: RSC	CHASKA PROJECT CHASKA, MINNESOTA		
CHECKED: TJS	CHASKA STAGE 4		
SUBMITTED BY:	DRAINAGE & LEVEES		
ED-8	PLAN & PROFILE		
ED-CH	STA. 36+70 TO STA. 45+50		
DATE: 07-29-92	CAD FILE NAME: MN10PO05.DWG	DRAWING NUMBER:	SHT 25
	SPEC NO:	M34-CH-R-64/224	OF 119

APPENDIX B

SECTION 2A
CLEARING, GRUBBING AND SNAGGING
INDEX

<u>Par No.</u>	<u>Description</u>	<u>Page No.</u>
1	SCOPE	2A-1
2	RELATED WORK OF OTHER SECTIONS	2A-1
3	NOT USED	2A-1
4	GENERAL	2A-1
5	NOT USED	2A-1
6	MATERIALS	2A-1
7	SURVEYS	2A-1
8	ORDER OF WORK	2A-1
9	CLEARING AND SNAGGING	2A-1
10	GRUBBING	2A-2
11	DISPOSAL OF DEBRIS	2A-3
12	MEASUREMENT AND PAYMENT	2A-3
13	BIDDING SCHEDULE ITEMS	2A-3

SECTION 2A - CLEARING, GRUBBING, AND SNAGGING

1. SCOPE: This section covers clearing, grubbing, and snagging of areas specified or shown, disposal of cleared, grubbed and snagged materials, and filling of grubbing holes.

2. RELATED WORK OF OTHER SECTIONS: The following items of related work are covered under other sections.

(1) Structures: SECTION: REMOVAL OF STRUCTURES.

(2) Disposal: SECTION: GENERAL.

(3) Clearing and Grubbing: SECTION: GENERAL.

3. NOT USED.

4. GENERAL: Clearing, grubbing, and snagging operations shall not be performed outside the designated work limits.

5. NOT USED.

6. MATERIALS:

6.1 Tree wound dressing: black asphalt base antiseptic paint specifically manufactured for the intended purpose.

7. SURVEYS: The Contractor shall have in place, at least 7 calendar days prior to commencing clearing operations, sufficient stakes to enable the Contracting Officer to mark trees to be left standing. These stakes shall define embankment foundation areas, alignment of structures, rights-of-way or other areal limits as directed, such that the Contracting Officer can easily determine, without additional surveys, the clearing limits. The Contracting Officer may waive these requirements for certain areas.

8. ORDER OF WORK: Clearing, grubbing, and snagging shall be completed at least 300 feet in advance of embankment construction. In locations where work on drainage structures is performed prior to embankment construction, clearing and grubbing shall be completed in advance for at least 100 feet in both directions from the structure, measured along the embankment center line. In addition the Contractor shall meet the requirements of Paragraph: Grubbing, Stripping, Excavating, and Filling: SECTION: GENERAL.

9. CLEARING AND SNAGGING: In areas where grubbing is not required, the clearing operations shall consist of the complete removal of all obstructions at or above the ground surface, except for trees and other items designated not to be completely removed and except for structures specifically scheduled for removal in SECTION: REMOVAL OF STRUCTURES. Clearing beyond the limits prescribed is subject to approval. Trees designated to be left standing within the cleared areas shall be trimmed of dead branches 1-1/2 inches or more in diameter and shall be trimmed of all branches to such heights and in such manner as are indicated or directed. Limbs and branches to be trimmed shall be neatly

cut close to the whole of the trees or main branches. Cuts more than 1-1/2 inches in diameter thus made shall be painted with an approved tree-wound dressing. Trees and vegetation to be left standing shall be protected from damage incident to clearing, grubbing, snagging, and construction operations by the erection of barriers or by such other means as the circumstances require.

9.1 Embankments (except disposal fills): Trees, stumps, down timber, lumber, snags, brush, vegetation, old piling, stone, boulders, riprap, concrete, abandoned structures, fencing, and similar debris shall be cleared within the limits of the embankment together with strips five feet wide beyond and contiguous thereto.

9.1.1 Trees: Certain trees, as designated by the Contracting Officer, shall be left standing.

9.1.2 Vegetation: Vegetation to be removed shall consist of all heavy growth of crops, grass, and weeds.

9.1.3 Miscellaneous structures and debris: The Contractor shall remove abandoned foundations, debris, structures, and other materials which remain after buildings or structures covered in SECTION: REMOVAL OF STRUCTURES, have been removed.

9.2 Borrow Areas: Clearing of borrow areas to the extent necessary to provide materials free from objectionable matter shall be performed.

9.3 Structures, Riprap, Channels and Ditches: Clearing shall be specified in Paragraph: Embankments, except the limits shall be the limits of excavation or riprap.

9.4 Roads, railroads and paths shall be cleared within the limits of the top of cuts or the toe of fills, together with strips five feet wide, beyond and contiguous thereto.

9.5 Fill areas and disposal fill areas shall be cleared to the extent required for placement of materials.

9.6 Snags consist of dead and broken trees and portions of trees that are lodged in the riverbed. Snags may be complete trees with large stumps and tops intact. All snags inside the designated limits shall be removed.

10. GRUBBING: Grubbing shall consist of the removal of stumps, roots, buried logs, old piling, old paving, and other objectionable matter, below the ground surface not classified as excavation.

10.1 Embankment and Structure Foundation Areas: The entire area within the limits of the embankment foundation together with the five foot strips contiguous thereto and the areas within the limits of all structures shall be thoroughly grubbed to a depth of not less than 18 inches. All tap roots, lateral roots, or other projections over 1-1/2 inches in diameter within the limits of embankment foundation areas shall be removed to a depth of 3 feet below the existing ground surface.

10.2 Roads, Railroads and Paths. Roads, railroads and paths shall be thoroughly grubbed to a depth of 18 inches to remove roots or other projections over 3 inches in diameter within the limits specified for clearing.

10.3 Borrow Areas. Borrow areas shall be grubbed to the extent necessary to provide materials free from objectionable matter.

10.4 Filling of Holes. Holes caused by grubbing operations, except in borrow areas, shall be filled with material corresponding to the adjacent undisturbed material so as to maintain the continuity of the natural blanket (foundation) soils. The backfill shall be placed in layers to the lower level of the adjacent stripping operations, and each layer tamped to a density equal to the adjoining undisturbed material.

11. DISPOSAL OF DEBRIS: Disposal of debris shall be as specified in SECTION: GENERAL.

12. MEASUREMENT AND PAYMENT: The work of this section will not be measured for payment and shall be performed on a job basis, complete.

12.1 Costs for clearing, grubbing, and snagging borrow areas shall not be included in the below listed bid item but shall be included in the bid item to which the borrow excavation pertains.

13. BIDDING SCHEDULE ITEMS applicable to the work of this section are as follows:

<u>Item</u>	<u>Unit</u>
Clearing, Grubbing, and Snagging	Job

* * * *

DATE: 08-14-92

Solicitation No. DACW37-93-B-0001

PART I
SECTION C - SPECIFICATIONS
DIVISION 2

SECTION 2L - STRIPPING

TABLE OF CONTENTS

<u>Par. No.</u>	<u>Description</u>	<u>Page No.</u>
1	NOT USED	2L-1
2	RELATED WORK OF OTHER SECTIONS	2L-1
3	NOT USED	2L-1
4	GENERAL	2L-1
5	SUBMITTALS	2L-1
6	NOT USED	2L-1
7	SURVEYS	2L-1
8	LIMITS	2L-2
9	QUALITY CONTROL	2L-2
10	MEASUREMENT AND PAYMENT	2L-2
11	BIDDING SCHEDULE ITEMS	2L-3

PART I
SECTION C - SPECIFICATIONS
DIVISION 2

SECTION 2L - STRIPPING

1. NOT USED.
2. RELATED WORK OF OTHER SECTIONS. The following items of related work are covered under other sections:
 - (1) Disposal of waste materials: SECTION 1C: GENERAL.
 - (2) Clearing and grubbing: SECTION 2A: CLEARING, GRUBBING AND SNAGGING.
 - (3) Topsoil Requirements: SECTION 2H: ESTABLISHMENT OF TURF.
3. NOT USED.
4. GENERAL.
 - 4.1 Stripping shall not proceed in any area until clearing and grubbing as specified in SECTION: CLEARING, GRUBBING AND SNAGGING in that area has been inspected and approved. Where topsoil is to be salvaged, grass and other vegetal matter shall be cut as close to the ground surface as practicable and disposed of in accordance with SECTION: GENERAL. Stripping shall consist of the removal of surface humus, vegetal-laden matter and other objectionable surface material.
 - 4.2 Topsoil suitable for incorporation in the permanent work, in accordance with SECTION: ESTABLISHMENT OF TURF, shall be stockpiled as directed and protected from contamination, or placed directly in the permanent work. Other material shall be wasted as specified in SECTION: GENERAL.
5. SUBMITTALS. The following items shall be submitted in accordance with SECTION L.
 - 5.1 Survey results as specified in PARAGRAPH: SURVEYS.
6. NOT USED.
7. SURVEYS. The following areas shall be surveyed and the resulting survey data submitted for approval prior to commencing stripping operations in order to determine area limits and ground surface elevations in sufficient detail to accurately compute excavation and fill quantities.
 - (1) Areas where excavation subsequent to stripping operations will be measured for payment by volume.

DATE: 08-14-92

(2) Areas where fill subsequent to stripping will be measured for payment by volume.

(3) Areas specifically designated for stripping as indicated on the drawings.

(4) Cross sections shall be conducted at a minimum of 50-foot intervals and presented in the form of elevations and offsets from the centerline.

8. LIMITS.

8.1 Areas as indicated on the drawings shall be stripped to the limits and depths shown unless directed otherwise.

8.2 Remaining Areas shall be stripped to the depths necessary to remove organic materials and vegetal-laden matter, and to segregate unsuitable materials from those suitable for fill material. Stripping beyond the limits of fill, excavation, or stone protection will not be permitted. Areas below the water surface need not be stripped.

9. QUALITY CONTROL. The Contractor shall establish and maintain quality control for work under this section to assure compliance with contract requirements and maintain records of his quality control for all construction operations including but not limited to the following:

- (1) Stripping to specified depth and within designated limits.
- (2) Suitability of exposed subgrade for receiving work.
- (3) Salvage and stockpiling of topsoil
- (4) Disposal.

A copy of the records of inspections and tests, as well as the records of corrective action taken, shall be furnished the Government as directed by the Contracting Officer.

10. MEASUREMENT AND PAYMENT. The work of this section will be measured as follows.

10.1 Areas Indicated on the Drawings. Stripping will be measured by the cubic yard, in place, to the finish lines and depths shown. The volume of authorized overdepth stripping will be determined by the average-end-area method based on the surveys performed before and after stripping operations. Unauthorized over-depth stripping and subsequent material required to backfill unauthorized overdepth stripping volumes will not be measured for payment.

10.2 For all other areas stripping, as such, will not be measured for separate payment and payment, therefore, will be made as follows:

10.2.1 In areas where excavation subsequent to stripping is to be measured for payment by volume, the volume cost of stripping within these

DATE: 08-14-92

areas, for payment purposes, will be considered included in the quantity of such excavation to the work for which the stripping is performed.

10.2.2 In areas where excavation subsequent to stripping is not to be measured for payment, the cost of stripping within these areas, for payment purposes, will be considered incidental to the work for which the stripping is performed.

11. BIDDING SCHEDULE ITEMS applicable to the work of this section are as follows:

<u>Item</u>	<u>Unit</u>
Stripping	C.Y.

* * *